Hazardous Waste Management at Healthcare Facilities

NCDENR - Division of Waste Management

Hazardous Waste Section

Compliance Branch

Resource Conservation and Recovery Act (RCRA) History

- Passed by Congress in 1976 to provide a cradle-to-grave management of hazardous waste

- Enforced by the following governmental agencies:
  - Federal - Environmental Protection Agency (EPA)
  - State - Division of Waste Management, Hazardous Waste Section

Hazardous Waste Section – Compliance Branch

Spring Allen **P.O. Box 1572** **Waynesville, NC 28786** **(828) 456-6155**	**VACANT**
Mark Burnette **P.O. Box 2481** **Indian Trail, NC 28079** **(704) 282-0697**	**VACANT**
Sean Morris **610 East Center Ave** **Mooresville, NC 28115** **(704) 663-1699**	**Ernie Lawrence** **585 Waughtown St.** **Winston Salem, NC 27107** **(336) 352-5742**

Phil Orozco **401 Oberlin Road** **1646 MSC** **Raleigh, NC 27699** **(919) 212-2501**	**Ted Cashion** **401 Oberlin Road** **1646 MSC** **Raleigh, NC 27699** **(919) 508-8557**	**Jenny Patterson** **585 Waughtown St.** **Winston Salem, NC 27107** **(336)-722-4852**
Dick Denton **P.O. Box 749** **Grimesland, NC 27837** **(252) 946-5011**	**Bobby Nelms** **127 Cardinal Dr.** **Wilmington,NC 28405** **(910) 602-3329**	

Doug Holyfield	**Branch Head**	**(336) 771-5355**
Mike Williford	**Eastern Region Supervisor**	**(919) 508-8572**
Brent Burch	**Western Region Supervisor**	**(828) 321-9585**
Robin Proctor	**Environmental Chemist**	**(828) 625-0171**
Kelly Galantis	**Administrative Support**	**(919) 508-8531**

What will be covered?

- Waste Determination
- Types of Generators
- Site Evaluation
- Generator Paperwork Requirements
- Generator Container Management Requirements
- Universal Waste Requirements
- Used Oil Requirements

What is Hazardous Waste?

It is waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment.

Hazardous Waste Determination

40 CFR 262.11

A person who generates a solid waste, as defined in 40 CFR 261.2, must determine if that waste is a hazardous waste using the following method:

1) Determine if the waste is excluded from regulation under 40 CFR 261.4

2) Determine if the waste is listed as a hazardous waste in Subpart D of 40 CFR 261

Hazardous Waste Determination

40 CFR 262.11 (cont'd)

3) If the waste is not listed in Subpart D of 40 CFR 261, the generator must then determine whether the waste is identified in Subpart C of 40 CFR Part 261 by either:
   - Testing the waste according to the method set forth in Subpart C of 40 CFR Part 261; or
   - Applying knowledge of the hazardous characteristics of the waste in light of the materials or the processes used

Hazardous Waste Determination

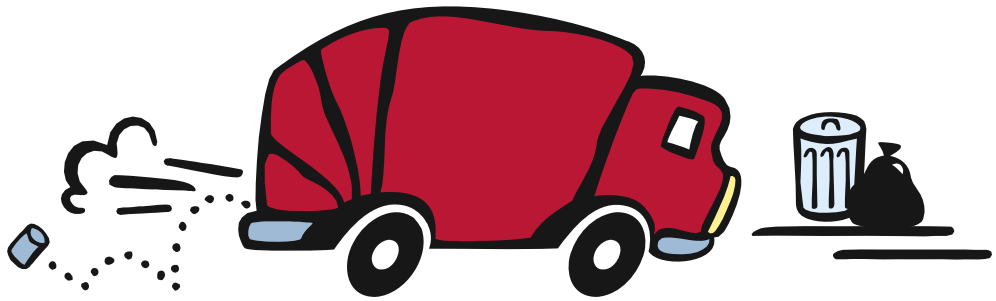
40 CFR 262.11

Is the material:

1) solid waste?
2) excluded/exempt?
3) “listed” hazardous waste?
4) “characteristic” hazardous waste?

What is a “Waste”?

A material that has been used or has otherwise served its intended purpose and, for whatever reason (e.g. contamination, spent) can or will no longer be used for its intended purpose.



What is Excluded or Exempt from Regulation?

- Materials that are not solid wastes:
  - Industrial wastewater when subject to CWA
- Materials that are not hazardous waste:
  - Household hazardous wastes
- Other
  - Used Oil to be recycled 40 CFR 261.6(a)(4)
  - Residues from RCRA Empty Containers

Residues of Hazardous Waste in Empty Container 40 CFR 261.7

A container is empty if:

- All wastes have been removed that can be removed using practices commonly employed to remove materials from the container (e.g. pouring, pumping and aspirating); and
- No more than 1 inch of residue remains in the bottom of the container; or
- No more than 3% by weight of the total capacity of the container remains in the container or inner liner if the container is ≤ 110 gallons; or no more than 0.3% by weight if the container is >110 gallons.

Residues of Hazardous Waste in Empty Container 40 CFR 261.7

Acute Hazardous Waste

- A container or inner liner removed from a container that has held an acute hazardous waste listed in Part 261.31, 261.32 or 261.33(e) is empty if:
- The container or inner liner has been triple rinsed using a solvent capable of removing the chemical product.

Residues of Hazardous Waste in Empty Container 40 CFR 261.7

- IV bags and associated equipment
  - Empty bags and equipment not containing acutely hazardous waste may be disposed of as empty containers
  - Bags and equipment with regulated material remaining must be managed as hazardous waste

What is “Listed” Hazardous Waste?

40 CFR 261 Subpart D

Listed Hazardous Waste

- F - Non-specific sources
- K - Specific sources
- P - Discarded products, off-specification species, container residues, spill residues
- U - Chemical products, intermediates, off-specification commercial products

P-listed Waste

Examples:

Arsenic Trioxide	P012
Epinephrine (Adrenaline)	P042
Nicotine	P075
Nitroglycerine	P081
Physostigmine	P204
Physostigmine Salicylate	P188
Sodium Azide	P105
Strychnine	P108
Warfarin >.3%	P001

U-listed Waste

Examples:

Acetone	U002
Chlorambucil	U035
Chloroform	U044
Cyclophosphamide	U058
Daunomycin	U059
Dichlorodifluromethane	U075
Diethylstilbestrol	U089
Formaldehyde	U122
Hexachlorophene	U132
Lindane	U129
Melphalan	U150
Mercury	U151
Mitomycin C	U010
Paraldehyde	U182
Phenacetin	U187
Phenol	U188
Reserpine	U200
Resorcinol	U201
Saccharin	U202
Selenium sulfide	U205
Streptozotocin	U206
Trichloromonofluromethane	U121
Uracil mustard	U237
Warfarin <.3%, (Coumadin)	U248

Chemotherapy Agents by Brand Name

Examples:

Brand Name	Chemical Name	Waste Code
Alkeran	Melphalan	U150
Cerubidine	Daunomycin	U059
CTX	Cyclophosphamide	U058
Cytotoxan	Cyclophosphamide	U058
Daunorubicin	Daunomycin	U059
DaunoXome	Daunomycin	U059
Leukeran	Chlorambucil	U035
Liposomal Daunorubicin	Daunomycin	U059
L-PAM	Melphalan	U150
Mitomycin	Mitomycin C	U010
Mutamycin	Mitomycin C	U010
Neosar	Cyclophosphamide	U058
Procytox	Cyclophosphamide	U058
Rubidomycin	Daunomycin	U059
Streptozocin	Streptozotocin	U206
Trisenox	Arsenic Trioxide	P012
Zanosar	Streptozotocin	U206

What is a “Characteristic” Hazardous Waste? 40 CFR 261 Subpart C

Characteristics

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

Characteristic Hazardous Waste

Ignitability (40 CFR 261.21):

- A liquid with a flashpoint of 140° F or less
- An aqueous solution containing more than 24% alcohol by volume with a flashpoint of <140 ° F
- Not a liquid and is capable, under standard temp. & pressure of causing a fire through friction, absorption of moisture or spontaneous chemical changes and when ignited, burns so vigorously and persistently that it creates a hazard
- Ignitable compressed gas as defined in 49 CFR 173.300

Characteristic Hazardous Waste
Ignitability Characteristic

Examples:

- Alcohol - denatured ethyl, ethyl, isopropyl alcohol
- Ammonia inhalants
- Amyl nitrite
- Aerosol spray – deodorants, aerosolized pain reliever
- Benzoyl peroxide
- Collodion based preparations
- Bronchial dilators
- Erythromycin topical solution
- Merthiolate tincture
- Mouthwash (alcohol content >24%)
- Silver nitrate (oxidizer)
- Some cough medicines

Characteristic Hazardous Waste

Corrosivity (40 CFR 261.22):

- Is aqueous and has a pH≤ 2 or ≥ 12.5
- Is a liquid and corrodes steel at a rate greater than 6.35 mm/yr

Characteristic Hazardous Waste
Corrosivity Characteristic

Examples:

- Glacial acetic acid
- Carbolic acid
- Potassium hydroxide
- Sodium hydroxide

Characteristic Hazardous Waste

Reactivity (40 CFR 262.23):

- Unstable and may explode or react rapidly or violently with water or other materials

Characteristic Hazardous Waste
Reactivity Characteristic

Examples:

- Some nitroglycerin formulations
- Clinatest
- Ethylene oxide
- Dry picric acid

Characteristic Hazardous Waste

Toxicity (40 CFR 262.24):

- Determined by Toxicity Characteristic Leaching Procedure (TCLP)
- Compare to 40 CFR 262 Subpart C Table 1 – Maximum Concentration of Contaminants for Toxicity Characteristics
- Examples:

Mercury: 0.2 mg/l	Silver: 5.0 mg/l
Lindane: 0.4 mg/l	Barium: 100.0 mg/l

Characteristic Hazardous Waste

Toxicity Characteristic

Mercury Containing Chemicals

- Merthiolate
- Mercury Nitrate
- Mercury Iodide
- Mercurochrome
- Thimerosal
- Vaccines containing mercury as a preservative

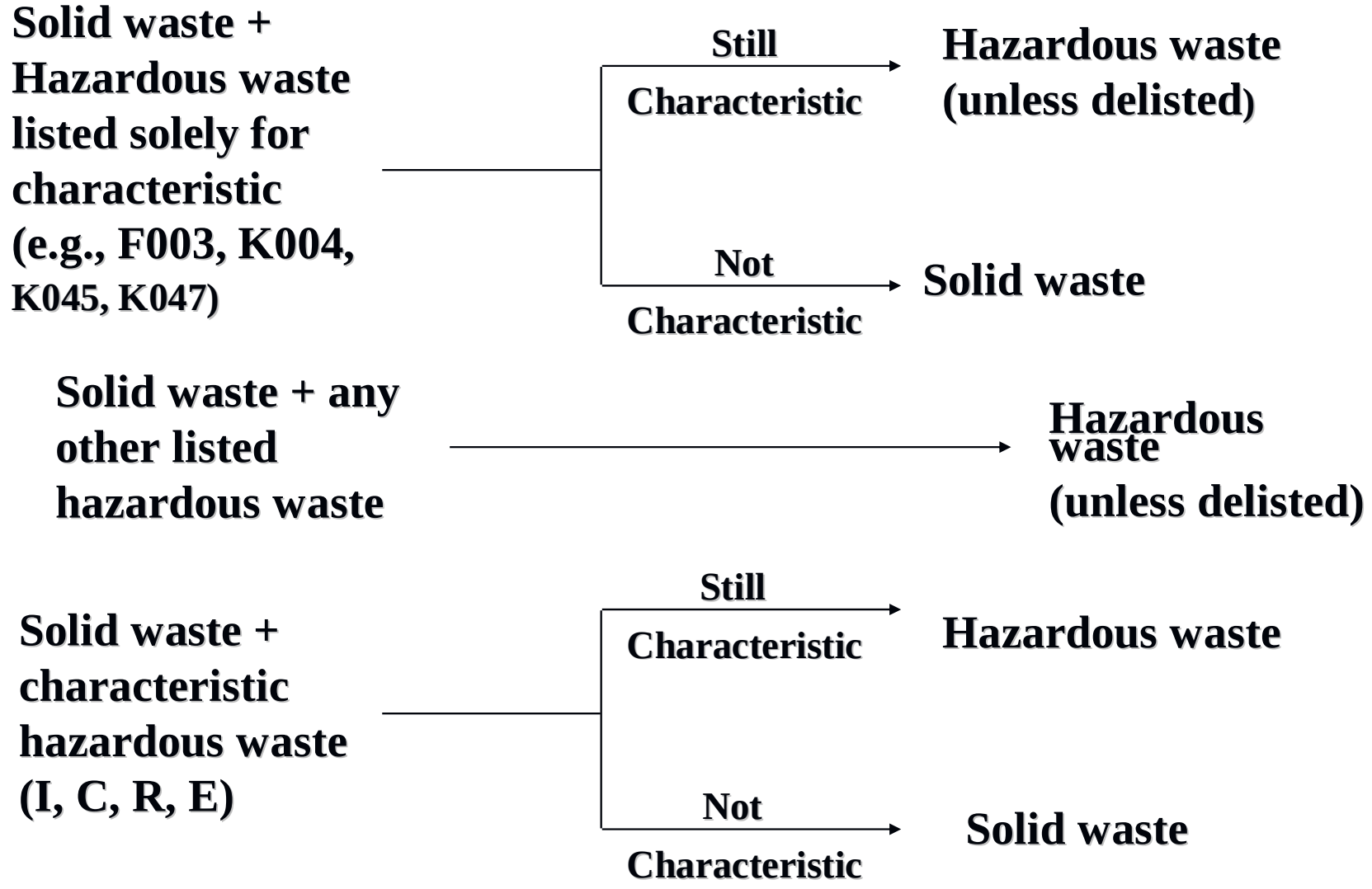
These can not be managed as mercury containing equipment!

Characteristic Hazardous Waste
Toxicity Characteristic

Examples:

- Photographic Fixer Waste - Silver (D011)
- Silver nitrate
- Insulin with cresol
- Barium compounds
- Some flu vaccines
- Lead shielding/aprons
- X-ray shielding putty

Hazardous Waste Mixtures 40 CFR 261.3(a)(2)(iii)



Where is hazardous waste generated?

Laboratories
Nursing units
Nuclear Medicine areas
Operating rooms
X-rays units
Dental clinics
Pharmacy
Morgue

Maintenance areas
Construction areas
Laundry
Vehicle maintenance
Grounds keeping

Hazardous Waste Generators

- Conditionally Exempt Small Quantity (CESQG)
  - ≤ 220 lbs per calendar month
  - ≤ 2.2 lbs acute hazardous waste
- Small Quantity (SQG)
  - >220 lbs and <2200 lbs per calendar month
  - ≤ 2.2 lbs acute hazardous waste
- Large Quantity (LQG)
  - ≥2200 lbs per calendar month
  - >2.2 lbs acute hazardous waste

Conditionally Exempt Small Quantity Generator Requirements 40 CFR 261.5

- Identify waste to determine whether it is hazardous waste (40 CFR 262.11)
- Do not accumulate more than 2200 lbs of hazardous waste or 2.2 lbs of acute hazardous waste at any time
- Treat/dispose of the waste on-site, or ensure that the waste is sent to a permitted or interim status TSDF, permitted municipal or industrial waste facility, or recycling facility

Small Quantity Generator Requirements 40 CFR 262.34

- Identify waste to determine if it is hazardous waste (40 CFR 262.11)
- Do not accumulate hazardous waste for >180 days
- Quantity must never exceed 6000 kg
- Hazardous waste must be placed IN containers
- Satellite accumulation containers labeled/closed

Small Quantity Generator Requirements 40 CFR 262.34

- Comply with 40 CFR 265 Subpart I except 265.176. Or the SQG tank requirements, 40 CFR 265.201, Subpart J
  - Each storage container/tank clearly marked with the words “Hazardous Waste” and marked with an accumulation start date
  - The containers are always closed and in good condition
  - Weekly inspections are conducted and documented

Small Quantity Generator Requirements 40 CFR 262.34

- Comply with Subpart C of 40 CFR 265 - Preparedness and Prevention
  - 24-hour Emergency Coordinator
  - Specific emergency information posted next to phone
  - Employees familiar with hazardous waste procedures
  - Adequate alarms and communications present
  - Emergency response equipment present, inspected and maintained
  - Agreements made with local emergency response authorities

Generator Record Review

- Emergency Information posted by phone
- Hazardous Waste Manifests / LDRs
- Inspection Records (<180 Day Storage Area)

Manifests
40 CFR 262 Subpart B and D

- Required to maintain manifests on-site for 3 years
  - RECOMMEND YOU KEEP THEM FOREVER!
- Must receive signed manifest from designated facility within 60 days of shipment
- Exception reporting requirements

Land Disposal Restrictions - "Land Ban" 40 CFR 268

Requirements for Generators

- Determine if the waste has to be treated before being land disposed
- Send a one-time written notice to each treatment or storage facility receiving the waste
- Retain a copy, on-site, for 3 years from the time the waste was last sent off-site

Inspections
40 CFR 265 Subpart I

- Weekly inspections conducted on less than 180 day storage area looking for leaks and deterioration caused by corrosion or other factors.
- Inspections must be documented

Weekly Hazardous Waste Container Inspection Log

Month: _____ Year: _____ Signature: _____

Inspection Date																										
Initials																										
Drum Integrity (no leaks, etc.)	Yes																									
	No																									
Drums Closed (bungs, etc.)	Yes																									
	No																									
Drums Labeled	Yes																									
	No																									
Evidence of Spills	Yes																									
	No																									
Accumulation Start Date	Yes																									
	No																									
	Yes																									
	No																									
	Yes																									
	No																									
	Yes																									
	No																									
Remarks, Problems, Corrections, etc.																										

Preparedness and Prevention
40 CFR 265 Subpart C

- Facilities must be maintained/operated to reduce risk of fire, explosion or releases of hazardous waste
- Certain emergency equipment must be available, tested and maintained as necessary
- Communication and alarm systems accessibility
- Emergency arrangements must be made with local emergency authorities

Small Quantity Generator Emergency Information
(Post next to telephone as required by 40 CFR 262.34(d)(5)(ii))

Emergency Coordinator(s)
with Telephone Numbers: _____

_____

Locations of:
Fire Extinguisher(s) _____

_____

Spill Control Material _____

_____

Fire Alarm(s) _____

_____

Fire Department Phone Number: _____

The Emergency Coordinator or his designee must respond to any emergencies that arise. The applicable responses are as follows:

FIRE: Call Fire Department or attempt to extinguish fire using a fire extinguisher.

SPILL: Contain the flow of hazardous waste to the extent possible, and as is practicable, clean up the hazardous waste and any contaminated material or soil.

In the event of a fire, explosion, or other release which could threaten human health outside the facility or when the generator has knowledge that a spill has reached surface water, the generator must immediately notify the National Response Center (24-hour hotline) at 1-800-424-8802 and notify the appropriate agency at _____
_____.

The information must include the following information:

1) Name, address, and facility USEPA Identification Number;
2) Date, time and type of incident (e.g. spill or fire);
3) Quantity and type of hazardous waste involved in incident;
4) Extent of injuries, if any; and
5) Estimated quantity and disposition of recovered materials, if any.

Generator Site Review:

- Generation Areas
- Satellite Accumulation Areas
- Storage Areas
- Emergency Preparedness and Prevention Measures
- General Facility Condition

Generation Areas

- Ensure that waste:
  - has been properly identified
  - is being managed correctly from point of generation
- Check for hazards, releases, emergency planning

Satellite Accumulation Areas

Requirements:

- Accumulated IN containers
- No more than a total of 55 gallons
- At or near the point of generation and under control of operator
- Labeled/marked with identifying words
- Closed unless adding or removing waste

Common Violations at Satellite Areas

- Not labeling/marking container
- Not keeping containers closed
- Accumulating more than a total of 55-gallons
- Having evidence of releases on or around the containers
- Having containers that are in poor condition
- Not performing a waste determination
- Placing containers in areas not at or near the point of generation and under the control of the operator

Common Storage Area Violations

- No labels or dates
- Containers open
- Evidence of releases or leaks
- Containers in poor condition
- Dates older than 180 days
- No aisle space and/or labels not visible

Release and Discharge of Hazardous Waste

- Release: ANY amount of hazardous waste that is not in a container or tank

- Discharge: a release of hazardous waste to the environment

Release and Discharge of Hazardous Waste

- If you have a release (on a container, floor, etc): clean it up immediately!
- If you have a discharge (a release to the environment):
  - Contact the Department immediately
  - Follow other emergency notification procedures

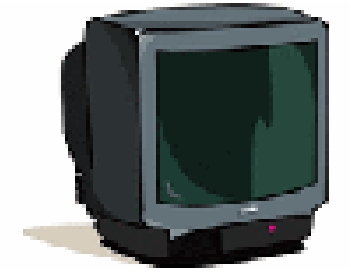
Discharges of Hazardous Waste

- Disposal: The discharge, deposit, injection, dumping, spilling, leaking, or placing of **any** solid waste or hazardous waste into or on any land or water **so that any constituent thereof may enter the environment** or be emitted into the air or discharge into any waters, including groundwaters.
- Therefore a **discharge** of hazardous waste is the same as **disposal** of hazardous waste

Maintenance Areas

- Building/equipment maintenance
- Vehicle maintenance
- Parts washers
- Sand/bead blasting units
- Used oil
- Universal waste

Cathode Ray Tubes (CRTs)



CRT Guidance

http://www.p2pays.org/electronics/policy.asp

New CRT Exclusions
40 CFR 261.4

- Effective January 29, 2007 & adopted by North Carolina April 1, 2007

- CRTs are **NOT** Universal Waste!

CRT Exclusions

Used intact CRTs are NOT solid wastes unless they are:

- Disposed of
- Speculatively accumulated (as defined in 261.1(c)(8)) by CRT collectors or glass processors
- Exported for recycling and do not meet the requirements of 261.40

Universal Waste

40 CFR 273

Universal Waste currently includes:

- Batteries
- Pesticides - not under FIFRA
- Mercury Containing Devices
- Lights Containing Mercury (LCMs)

Mercury Containing Equipment

- New Rule – adopted August 5, 2005
- Replaces “Thermostats” as a category of universal waste
- Definition: A device or part of a device (including thermostats but excluding lamps and batteries) containing elemental Hg integral to its function.

Used Oil Defined - G.S. 130A-290(b)

Criteria For Used Oil:

- Origin: crude/synthetic oil
- Use: used as a lubricant, coolant, non-contact heat-transfer fluid, hydraulic fluid, buoyant or other similar use
- Contamination: by physical/chemical impurities

Examples of Used Oil

- Used motor oil
- Used hydraulic oil
- Used transmission fluid
- Spent synthetic cutting & machine oils
- Spent quench oils
- Non-PCB transformer oils
- CFC contaminated oils from refrigeration units/air conditioning units

Used Oil Does NOT include

- Petroleum based products not used as a lubricant or in other protective applications
  - Gasoline, diesel fuel, mineral spirits, kerosene
- Vegetable oils
- Animal oils
- Antifreeze

Used Oil Generators

40 CFR 279.1

Person(s), by site, whose act or process first causes used oil to be subject to regulation.

- Different from a hazardous waste generator
- No distinction based on quantity
- Exemptions:
  - Household do-it-yourselfers
  - Farmers generating ≤25 gal/month from farm machinery/vehicles

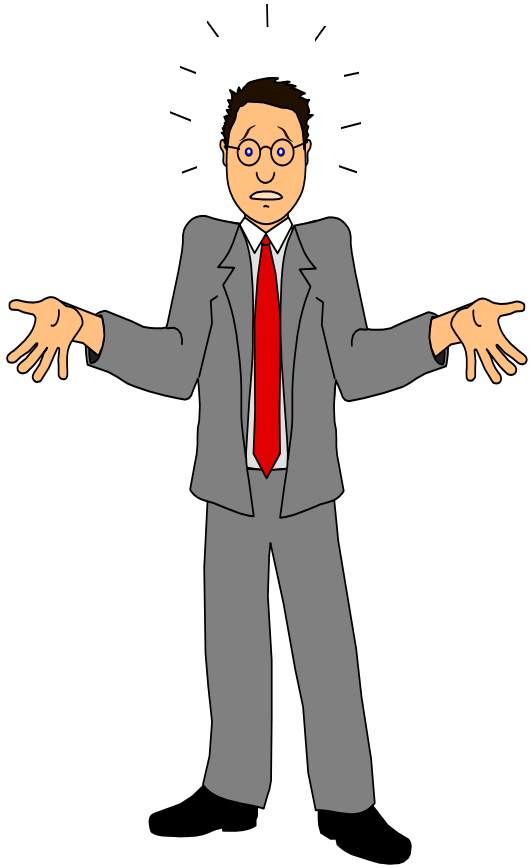
Used Oil Generator Requirements

40 CFR 279

- Store only in tanks/containers in good condition
- Label tank/container “Used Oil”
- Clean up any spills/releases immediately
- Self transport no more than 55 gallons to collection center
- Used oil transporter with EPA ID Number

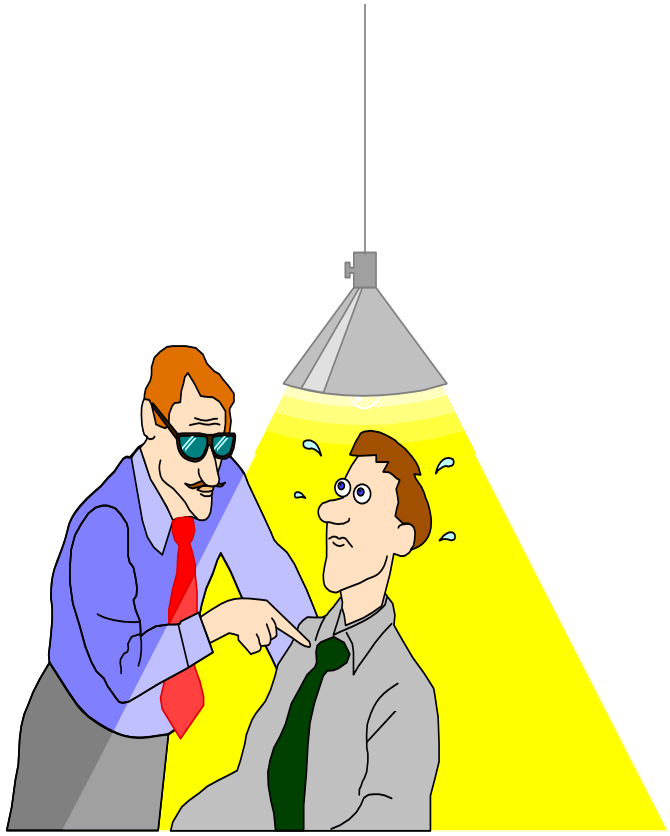
What Happens Now ?

- The facility will receive an inspection report either in the mail or at the end of the inspection
- Make corrections immediately



Types of Notice of Violations

- Ticket Notice of Violation
- Standard Notice of Violation
- Immediate Action Notice of Violation



Ticket Notice of Violation

- Developed and issued by the Waste Management Specialist conducting inspection
- Typically, consists of six or fewer violations
  - deficiencies that are easily corrected
- The compliance schedule is usually 30 days from the date of issue

Standard Notice of Violation

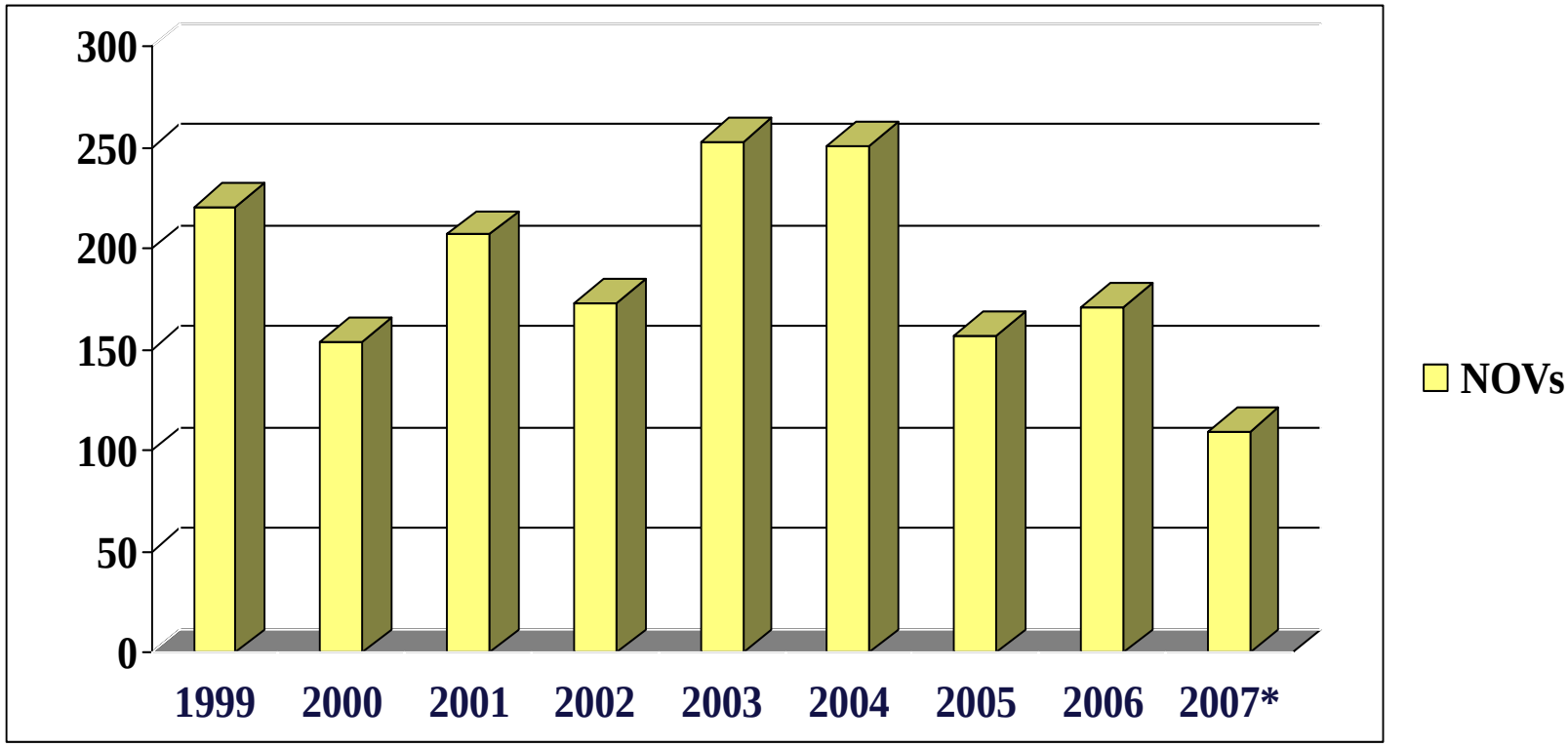
- Developed by the Waste Management Specialist and signed by Hazardous Waste Section Chief
- More than 6 violations - typically repeat violations and violations that have posed a significant potential threat to human health and the environment
- The compliance schedule is usually 30 days from the date of issue

Immediate Action NOV

- Developed by the Waste Management Specialist and signed by Hazardous Waste Section Chief
- Violations pose potential immediate health or environmental threats
  - Examples include management of unknowns and unremediated spills
- Compliance schedule will specify steps that must be taken to assess and remediate any environmental contamination

Hazardous Waste Notices of Violation

*2007 numbers as of August



Short Form Compliance Order

- Short Form Orders carry a maximum penalty of $5,000.00 per violation.
- Issued for violations that creates an imminent potential threat to human health or the environment.
- Violations vary due to the specific details of each case. Examples include: repeat violations discovered during a reinspection and for non-compliance with previous NOV's.

Standard Compliance Order

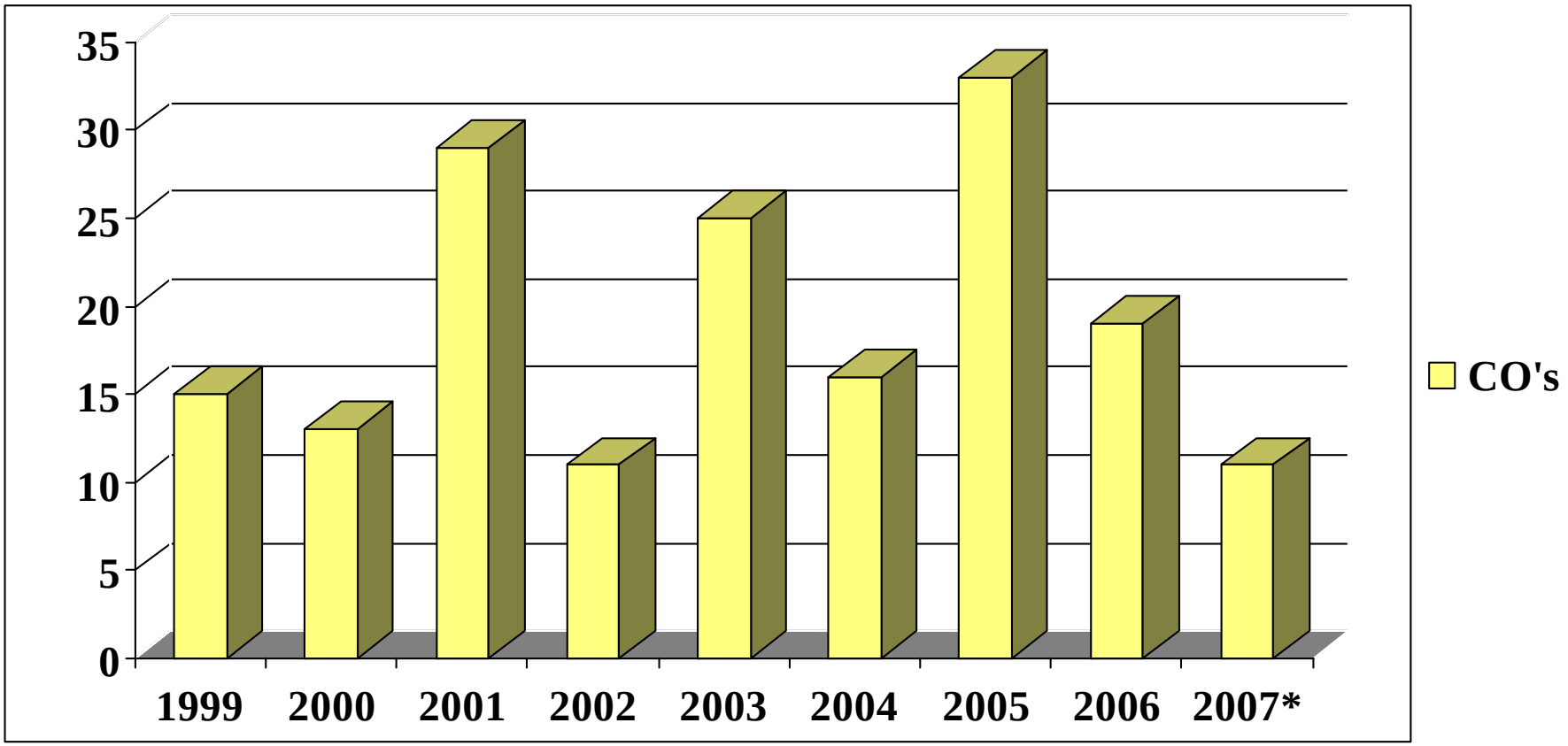
- Standard Compliance Orders carry a maximum penalty of $25,000.00 per day, per violation.
- Issued for significant violations that pose an immediate threat to human health and the environment.
- Violations vary due to the specific details of each case. Examples include not having proper waste determinations and operating as a TSD facility without a permit.

Administrative Order on Consent

- Entered in by both the Division and a facility
  - based on a resolution to a Compliance Order or
  - a voluntary action of the facility identifying a problem (Self Confessor Policy)
- Typically a stipulated penalty is included to recover any economic benefit.

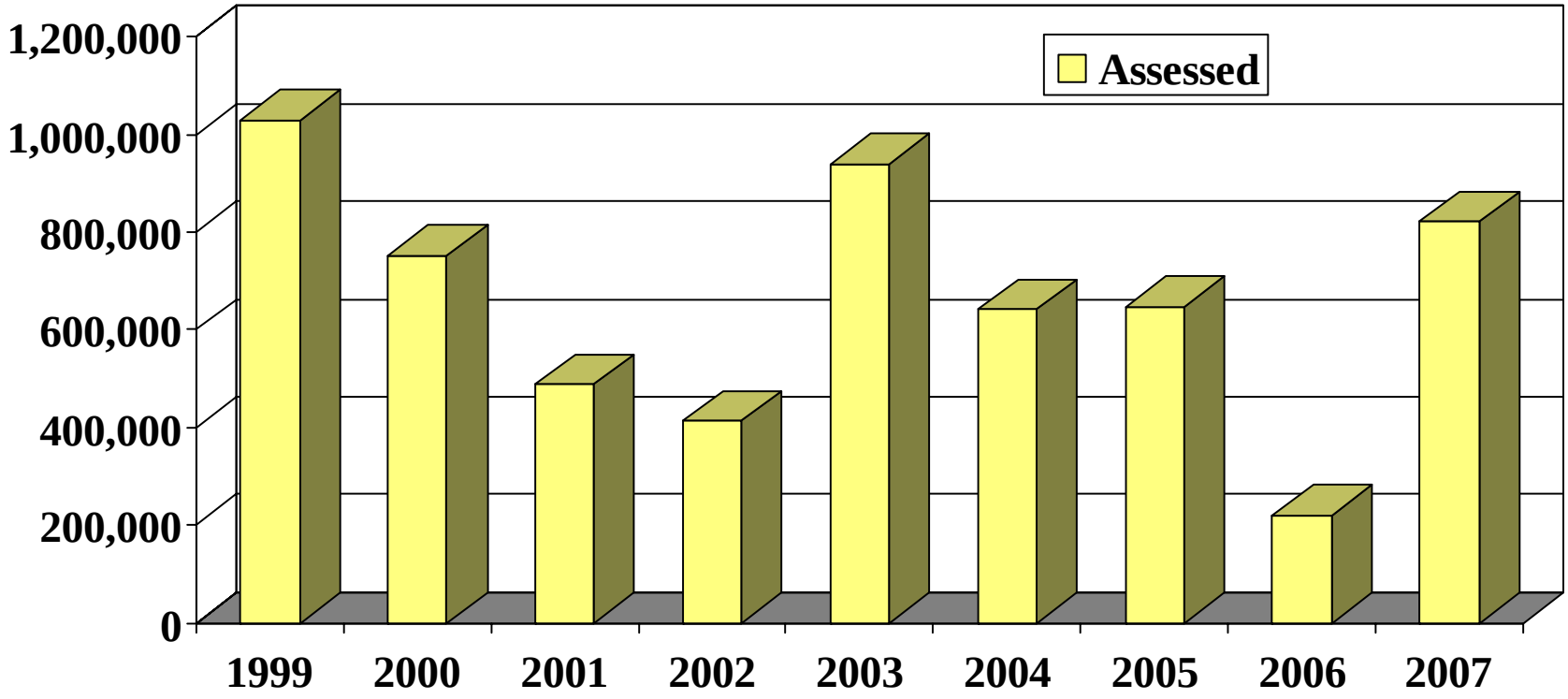
Hazardous Waste Compliance Orders

*2007 numbers as of June



Hazardous Waste Section Penalties

2007* numbers as of June



Penalty Consequences

- The Department issues monthly press releases on penalties. Also - www.wastenot.enr.state.nc.us
- Identifies the facility, summarizes the violations found, and the total penalty assessed.
- Could jeopardize opportunities in the future such as pollution prevention grants, private/ government contracts and overall corporate image.

Self - Confessor Policy

- A Department wide enforcement penalty policy for self reported violations.
- The Department will not seek administrative or civil penalties beyond the economic benefit the company received if the company meets all five conditions set forth in the policy.

Conditions for Penalty Waiver

- Condition 1 - The deficiency was not due to a lack of good faith efforts to understand or comply with applicable environmental, health, or safety laws, or a lack or good faith efforts to correct past deficiencies.

- Condition 2 - The deficiency was not done knowingly and willingly.

- Condition 3 - The deficiency did not cause a significant harm to the environment or risk to public health.

Conditions for Penalty Waiver

- Condition 4 - The regulated person or entity voluntarily and promptly notifies the Department of the deficiency before the Department learns of it and completely discloses the deficiency to the Department in writing.

- Condition 5 - The regulated person or entity takes immediate and effective action to cease or remediate any continuing violation or deficiency, or where appropriate, agrees in writing with the Department to take those steps needed to address the deficiency.

Self Confessor Policy (Cont'd)

In all cases, the regulated person or entity seeking penalty waiver or reduction must provide sufficient documentation to eligibility for the application of this policy, and must bear the burden of persuasion that waiver or reduction is appropriate and that there was no economic benefit from the deficiency.

NCDENR - Division of Waste Management
Hazardous Waste Section

Compliance Branch

Jenny Patterson – Environmental Senior Specialist

Mailing Address: 585 Waughtown Street

Winston-Salem, NC 27103

Phone: 336-722-4852

Fax: 336-771-4630

Email: jenny.rankin@ncmail.net

Guilford, Rockingham, Randolph Counties